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EXPERIENCE PROGRAMS CONDUCTED IN VOCATIONAL HORTICULTURE PROGRAMS IN OHIO HIGH SCHOOLS IN 1966.

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DESCRIPTORS- *VOCATIONAL AGRICULTURE, *HORTICULTURE, *WORK EXPERIENCE PROGRAMS, EDUCATIONAL FACILITIES, *TEACHER ATTITUDES, STATE SURVEYS, HIGH SCHOOLS, COURSE CONTENT, STUDENT ENROLLMENT, PROGRAM EVALUATION, QUESTIONNAIRES, OHIO,

A STUDY OF OCCUPATIONAL EXPERIENCES FOR VOCATIONAL HORTICULTURE STUDENTS WAS DESIGNED TO DETERMINE THE KINDS OF HORTICULTURE PROGRAMS AND THE TYPES AND SCOPE OF EXPERIENCE PROGRAMS OFFERED AND OBTAIN TEACHER APPRAISALS OF THE EXPERIENCE PROGRAMS WHICH SHOULD BE REQUIRED AND THE FACILITIES NEEDED TO PROVIDE SATISFACTORY PROGRAMS. OF 25 SCHOOLS OFFERING VOCATIONAL HORTICULTURE, 22 REPORTED 509 STUDENTS ENROLLED IN VOCATIONAL HORTICULTURE WHICH REPRESENTED ABOUT 4 PERCENT OF THE TOTAL OHIO VOCATIONAL AGRICULTURE ENROLLMENT. TEN SCHOOLS OFFERED 1-YEAR, 7 OFFERED 2-YEAR, 4 OFFERED 3-YEAR PROGRAMS, AND 1 COMBINED THE COURSE WITH AGRICULTURE. NINE SELECTED TOPICS WERE TAUGHT IN SOME GRADE LEVEL BY AT LEAST 70 PERCENT OF THE TEACHERS, AND SOME TOPICS, SUCH AS LANDSCAPING, WERE TAUGHT AT ALL GRADE LEVELS. EXPERIENCE PROGRAMS WERE CONDUCTED AT HOME FOR 51 PERCENT OF THE STUDENTS, IN COOPERATING BUSINESSES FOR 27 PERCENT, AND AT SCHOOL FOR 14 PERCENT. NO EXPERIENCE PROGRAM WAS REPORTED FOR 8 PERCENT OF THE STUDENTS. TEACHERS RECOMMENDED 500 SQUARE FEET FOR HOME FLOWER OR GARDEN PROJECTS AND 10,000 SQUARE FEET FOR NURSERIES, AND 200 HOURS OF EXPERIENCE PER YEAR FOR HOME AND SCHOOL PROJECTS AND 300 HOURS FOR COMMERCIAL PLACEMENT. RECOMMENDATIONS CONCERNED A 2-YEAR MINIMUM LENGTH FOR VOCATIONAL HORTICULTURE PROGRAMS, USE OF A CURRICULUM GUIDE TO DETERMINE THE SUITABLE GRADE LEVEL FOR DIFFERENT TOPICS, EXPERIENCE PROGRAMS WITH MINIMUM STANDARDS AVAILABLE TO ALL STUDENTS, AND MINIMUM FACILITIES REQUIREMENTS. THIS IS A M.S. FIELD STUDY SUBMITTED TO THE COLLEGE OF AGRICULTURE, THE OHIO STATE UNIVERSITY. (JM)

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EXPERIENCE PROGRAMS CONDUCTED IN VOCATIONAL HORTICULTURE PROGRAMS IN OHIO HIGH SCHOOLS IN 1966

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A Field Study

Presented to

the Faculty of the College of Agriculture

The Ohio State University

In Partial Fulfillment

of the Requirements for the Degree

Master of Science

by

Bernard R. Nirode

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Approved by

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Advisor

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EXPERIENCE PROGRAMS CONDUCTED IN VOCATIONAL HORTICULTURE PROGRAMS IN OHIO HIGH SCHOOLS IN 1966

CHAPTER I

INTRODUCTIONS

Nature of the Study

In the last several years, there has been a rapid urbanization in many of our school districts which previously had been predominantly rural and agricultural. For many years, programs of vocational agriculture in these schools emphasized training for farming. But, with urbanization, new needs have arisen to train students, both boys and girls. One of these is in the area of horticulture. As a result schools have added programs of vocational horticulture to meet the need of students seeking employment in the horticultural industry.

Some schools have added new departments of vocational agriculture which teach only horticulture. These are very similar to our existing departments of vocational agriculture. Others added programs of vocational horticulture to existing programs of vocational agriculture. Regardless of their organization in the school system, they are new administratively in the Ohio program and so there are many unsolved problems that must be solved if we are to conduct effective programs in horticulture.

One of these problems of concern in teaching vocational horticulture is the development of adequate experience programs including

both production and placement projects. A point to be considered is the specific kind of experience that is needed by students to become properly prepared to begin employment in any one of the many occupations in the horticulture industry. These jobs could be in the phases of fruits, vegetables, floriculture, nursery, greenhouse, landscape, or others.

A second factor to be considered is the minimum requirements for high school students persuing vocational training in horticulture. Generally, there seems to be no minimum standards now available which must be met in an experience program for this vocational course in horticulture. As a result, such questions as this one exist; Is a dozen tomato plants in the backyard a satisfactory project for a student's experience program in vocational horticulture?

Statement of the Problem

With the rapid development of vocational horticulture programs in Ohio, there is a growing need to have knowledge concerning not only the types of experience programs being offered, but also the scopes of these experiences. In addition, the need has developed to obtain an appraisal of these existing vocational horticulture experience programs to help strengthen the existing departments and to help guide teachers in the new departments. An appraisal of existing vocational horticulture experience programs by all Ohio teachers who are now conducting a program may assist schools in establishing or improving the needed facilities, such as greenhouses and land laboratories, and to help meet the need of satisfactory experience programs for students enrolled in vocational horticulture.

Purpose

The purpose of this study is two fold; (1) to determine the desirable experiences that can be provided students in vocational horticulture, and (2) to determine how these experiences should be provided.

Specific Objectives

1. To determine the kinds of vocational horticulture programs that are offered to students enrolled in vocational horticulture in Ohio.

2. To determine the types and scopes of experience programs now being offered to students enrolled in all high school vocational horticulture courses in Ohio.

3. To obtain teacher appraisals of the types and scopes of experience programs which should be required for vocational horticulture students.

4. To obtain teacher appraisals of the needed facilities in a high school to help provide satisfactory experience programs for students of vocational horticulture.

Need for the Study

The rapid development within vocational education has brought about a shortage of teachers. Vocational horticulture is no exception and some of the present teachers have had limited background in the field and are seeking assistance to improve professionally. On this premise, the author sees a need to at least try to help teachers, by obtaining some appraisals of programs from older teachers who are now teaching courses of vocational horticulture.

Basic Assumptions

1. Vocational horticulture will continue to be an important part of the total vocational education program in Ohio.

2. High school students who are intending to enter horticultural occupations can be prepared for entry through programs of vocational horticulture.

3. Facilities being used now are not adequate for teaching vocational horticulture.

Limitations of the Study

1. The data secured from Ohio teachers who have taught vocational horticulture are treated in mass, they are provincial and may lack reliability.

2. The extent of teachers' competency to properly appraise means for improving existing experience programs of vocational horticulture.

3. The general nature of this instrument does not lend itself to a sophisticated evaluation of the program.

Definition of Terms

Experience Program - includes any type of production project, such as fruits or flowers, and work placement at home, the school, or in a commercial business related to some area of horticulture.

Vocational Horticulture - a course of study for any high school student, which may include any of the following phases: fruits, vegetables, floriculture, nursery, greenhouse, and landscaping, and the areas of instruction relating to each.

Method of Investigation

A list of all the schools who have offered at least one year of any phase of vocational horticulture was obtained from the State Department of Education, Vocational Agriculture Service Office. The information was taken from the vocational agriculture departmental reports sent in by all vocational agricultural teachers to the state office.

Mr. Darrell Parks[1] secured this information for me. There were twenty-nine schools that reported a course in vocational horticulture.

A questionnaire was developed to obtain data which would help to answer objectives of the study. The population was not a sample, but included all twenty-nine schools in Ohio with vocational horticulture programs. Therefore, the type of programs range from a complete three-year course in greenhouse management to a one-year course in introductory horticulture. The instructors' educational background in horticulture is also very different. Some teachers have a college major in horticulture, while other teachers have only a few courses in horticulture. As a result, there is a great variation in the overall administration of the programs among the schools.

It was found that four of the twenty-nine schools did not have a vocational horticulture course. One school offered conservation instead, and the other three schools did not get the program started. Twenty-two of the twenty-five schools that offered vocational horticulture returned questionnaires to me.

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[1]Mr. Parks is an Assistant State Supervisor, Vocational Agriculture, and is responsible for the general development of the program of vocational horticulture in Ohio.

The questionnaire was designed to determine the types of courses being offered in high school programs, the types and scopes of experience programs being offered, the appraisal by teachers of the experience programs now being offered, and the suggestions of teachers to improve the program.

The data are grouped first, according to the kind of course that was offered and facilities used, then according to the type of experience programs offered. Finally, a comparison was made of teachers' appraisals of the various experience programs. With these groupings and comparisons, the general conclusions include the kinds of experience programs which teachers of vocational horticulture should attempt to provide, and the types of school facilities which are needed to help provide adequate experience programs.

Review of Studies

The literature review includes a selected group of studies which relate to this study. They were selected on the basis of providing evidence for the need of vocational horticulture programs, and the implications for modifying the present vocational agriculture programs in terms of experience programs, curriculum, and facilities.

Study by J. Gale Leimbach

This thesis was a study concerning the number of urban boys enrolled in vocational agriculture, and in general their effect upon the vocational agriculture programs. The author found in general that an increasing number of urban boys were taking vocational agriculture and consequently the total vocational agriculture enrollment was also

increasing. According to the study, many of the urban boys were obtaining valuable training from vocational agriculture in preparation for their future occupations. Another finding was that about 75% of the teachers had made some changes in their curriculums in the areas of farm mechanics and crop production, including horticulture, because of the urban students.[2]

Study by George Albert Landon

The purpose of this study was to determine the number of non-farm students enrolled in high school vocational agriculture classes, to compare these students' experiences in Vocational Agriculture with those of other students, and to determine occupations of non-farm students upon graduation. In general, the results of the study showed that the number of non-farm students enrolled in vocational agriculture was increasing, and that four years after graduation none of these non-farm students were in farm or related occupations. Another finding was that 75% of the teachers reported changes in their curriculum as a result of the non-farm students.[3]

Study by John C. Billick

The purpose of this study was to determine what kind of training and experience would be desirable for the farm-related occupations

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[2]Gale J. Leimbach, Vocational Agriculture for Students from Urban Homes (Thesis). Columbus: The Ohio State University, 1964.

[3]George Albert Landon, Present Status of Non-Farm Students Enrolled in High School Vocational Agriculture and their Occupations Following Graduation (Thesis). Columbus: The Ohio State University, 1962.

available in the two county area defined in the study. It was found that there was a need to train some vocational agriculture students for farm-related occupations, and that the present program and curriculum of vocational agriculture was doing a satisfactory job of training most of the students for these jobs.[4]

Study by Craig Stanley Oliver

The hypothesis of this study was that there was no significant difference between the effectiveness of using a calendar of activities for greenhouse instruction versus not using a calendar of activities for greenhouse instruction with first year students enrolled in vocational agriculture as measured by a written multiple-choice pre-test and post-test. Conclusions of the study stated that a calendar of activities in the vocational agriculture department greenhouse aided in the instructional program, and that students who were taught by teachers using the calendar of activities achieved higher scores in subject matter knowledge than those students not taught by the calendar of activities method.[5]

Summary

These studies indicate an increased enrollment of urban students in vocational agriculture; and some of the modifications in the vocational agriculture program which resulted. Three of the studies found

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[4]John C. Billick, Employment in Farm-Related Occupations for Students of Vocational Agriculture in Erie and Huron Counties, Ohio (Thesis). Columbus: The Ohio State University, 1959.

[5]Craig Stanley Oliver, Development and Testing of a Calendar of Activities for Greenhouses in Vocational Agriculture Departments in Pennsylvania High Schools (Thesis). State College: The Pennsylvania State University, 1960.

that there was a need to train non-farm boys in related occupations. Two of these three studies indicated that changes in the curriculum to include vocational horticulture were made to meet the needs of the non-farm students.

Three of the studies indicated that changes were made in the curriculum in an attempt to better meet the needs of the non-farm students.

CHAPTER II

FINDINGS OF THE STUDY

Introduction

This chapter presents information which describes the types of programs now in operation in Ohio. The number of schools offering one, two, and three years of vocational horticulture, subject matter content of the program, student enrollment, types of student experience programs, and type of school facilities are presented in this chapter.

Number and per cent of schools who have so far offered one, two, and three years of vocational horticulture

Ten of the twenty-two schools have to date offered only one year of vocational horticulture. It would seem from this information that the vocational horticulture program in Ohio is just getting started. Table I shows additional facts that help to support this. Only four schools have a three-year course. Three of these four schools that have a three-year course have offered vocational horticulture for three years, and the other school has offered it for five years. This seems to indicate that as the programs become older, they change to a three-year course.

Seven schools offer a two-year course. Seventy-one per cent of these schools have offered vocational horticulture for only two years.

Again, this fact appears to indicate that the vocational horticulture program in Ohio is in an early stage of development. The other two schools which offer vocational horticulture for two years also conduct a two-year course in vocational agriculture with one teacher. Therefore, these two schools are limited to a two-year vocational horticulture program because of the lack of sufficient teacher personnel.

Table I

NUMBER AND PER CENT OF SCHOOLS WHO HAVE SO FAR OFFERED ONE, TWO, AND THREE YEARS OF VOCATIONAL HORTICULTURE.

Number of Years	Number of Schools	Per cent of Schools
1 year	10	45
2 years	7	32
3 years	4	18
Combined with Agriculture	1	5

Table I illustrates the stage of development in the Ohio vocational horticulture program. Probably, many of the two-year courses will convert to a three-year course after the second year of offering the course. However, several may remain as two-year programs. For example, Penta County Joint Vocational School is limited to only junior and senior students. Therefore, Penta County will probably remain as a two-year program. The two schools which have only one teacher who conducts two-year courses in both vocational agriculture

and horticulture are limited also, unless some changes are made in the over-all vocational agriculture program in the high school.

The one-year courses do not seem to follow the same general pattern of development. Four of these schools have offered vocational horticulture for only one year, but the other six schools have offered vocational horticulture for three or more years. It appears that many of these will remain as one-year courses. The question might be asked whether these schools offer vocational horticulture for the purpose of maintaining student enrollment to retain a full unit of vocational agriculture in the school. However, some one-year courses may change to a two or three year program.

Topics taught and the grade level in which each topic was taught

There was a wide range of topics taught in the vocational horticulture courses, and also in the grade level which they were taught. Table II indicates the grade level in which the introduction to horticulture was taught. Introduction to horticulture includes careers, opportunities, and a general knowledge of the field of horticulture as defined in the questionnaire. This data appears to indicate the number of years of vocational horticulture taught in the school.

Twenty-seven per cent of the schools offered introduction to horticulture during the junior or senior year, which seems to limit the length of the program. But, Table I shows that 45 per cent of the schools offer a one-year course. Therefore, it seems that at least twenty-five per cent of the schools who offer introduction to horticulture during the freshman and sophomore years offer only a one-year course. A question may be asked as to why these schools offer an

introduction to horticulture during the freshman or sophomore year, but do not offer another course in horticulture to these students. Another question might be what happens to these students; do they continue in other vocational agriculture courses or do they drop vocational agriculture and vocational horticulture?

Table II

NUMBER AND PER CENT OF SCHOOLS OFFERING THE FIRST COURSE OF VOCATIONAL HORTICULTURE IN THE FRESHMAN, SOPHOMORE, JUNIOR, AND SENIOR YEAR.

Grade Level	Number of Schools	Per cent of Schools
Freshman	7	32
Sophomore	9	41
Junior	4	18
Senior	2	9

The teachers were asked to indicate the topics of major emphasis they taught to their students during each grade level. Table III reveals the responses to this question.

It appears from this table that two other topics, besides introduction to horticulture as indicated in Table II, are most commonly taught during the freshman or sophomore year. These topics are soils and fertilizers, and plant structures and processes. Besides these three topics, there seems to be very little uniformity as to what grade level each of the other topics are taught. Consequently, this seems

to indicate flexibility in the curriculum development for each grade level.

Nine of the topics were taught in seventy per cent or more of the schools. Only four topics were taught by less than seventy per cent of the schools. As a result, there appears to be some uniformity in the type of topics taught during the entire length of the program by the twenty-two schools.

Table III

TOPICS OFFERED IN VOCATIONAL HORTICULTURE AND THE GRADE LEVEL IN WHICH EACH TOPIC IS TAUGHT

Topic	Number of Schools Offering Topic				
	Total No. of Schools	Freshman Year	Soph. Year	Jr. Year	Sr. Year
Introduction to Horticulture	22	7	9	4	2
Soils and Fertilizers	22	5	9	4	4
Landscaping	22	0	5	6	11
Plant Structures and Processes	19	4	8	4	3
Turf Management	18	2	5	6	5
Ornamental Horticulture	18	0	4	7	6
Floriculture	16	0	4	7	5
Nursery	16	0	3	7	6
Vegetables	15	2	4	4	5
Fruits	10	2	3	1	4
Conservation	9	1	4	2	2
Forestry	9	1	2	2	4
Greenhouse Management	2	0	0	0	2

Student enrollment in each school

Table IV indicates that student enrollment may be a limiting factor in changing a two-year course to a three-year course. The average total enrollment in a three-year program is 33, which is an average of eleven students per course year. In the two-year programs there is an average total enrollment of eighteen, which is only nine per class. However, the two-year course may have only sophomore and junior students enrolled, and in the third year of the program would have three grade levels enrolled, which would increase the total enrollment.

One-year programs have an average total enrollment of nineteen. It would appear that these schools have enough students to conduct a two-year course. The question may be asked as to why they are only one-year programs.

Student experience programs

Types of experience programs conducted by vocational horticulture students are shown in Table V. Forty-six per cent of the students had projects at home, ten per cent at the school, and thirty-five and one-half per cent at work placement jobs. The remaining eight and one-half per cent have no planned experience programs or were not reported. Although no trends are indicated in the table, it seems that the per cent of home projects is less than in vocational agriculture programs. Does this indicate less home supervision and contact with the parents? If so, a point to consider might be what are the implications for the vocational horticulture program because of less home supervision. Does this result in less supervision of the students' experience program?

Table IV

STUDENT ENROLLMENT IN EACH SCHOOL ACCORDING TO ONE, TWO, OR THREE YEAR COURSE

School	Enrollment
Part I--3 Year Course	
Pleasant View	46
Cleveland West Technical	37
Kenton	25
Westerville	24
Sub Total	132
Part II-2 Year Course	
Mentor	45
Penta County	18
Cleveland J. F. Kennedy	18
Hilliard	17
Jefferson Union	12
Greenon	10
Canal Winchester	9
Sub Total	129
Part III-1 Year Course	
Manchester	42
Cleveland John Adams	37
Clear Fork	36
Cleveland Memorial	21
Pickerington	20
Wooster	9
Colonel Crawford	8
Stryker	8
Dublin	6
Shawnee	5
Sub Total	192
Part IV-Combined With Vocational Agriculture	
Mt. Gilead	56
Sub Total	56
Total	509

Table V

STUDENT EXPERIENCE PROGRAMS CONDUCTED DURING THE SCHOOL YEAR

1965-66

Type of Experience Program	Number of Students*	Per Cent of Students
Home vegetable garden	135	26
Home flower garden	101	20
Total	236	46
Grow plants in school greenhouse	46	9
School vegetable garden	4	1
Total	50	10
Work placement at commercial business	138	27
Work placement at home	23	4.5
Work placement at school	19	4
Total	180	35.5
No planned experience	2	0.5
Related project	1	0
No experience program reported in questionnaire	40	8
Total	43	8.5

*The same student may have more than one type of experience program; therefore, some students' experience programs may not be reported in the questionnaire.

The work placement programs in general seem to be different than the placement jobs in vocational agriculture. For example, why is a student in vocational horticulture permitted to have work placement at home, whereas this program is generally not accepted in vocational agriculture farming programs? In other words, if a student can get work placement at home, why can't he conduct a project at home? Or does this mean that standards for experience programs have been changed? The same situation would appear to be true for work placement at the school. However, these work placement experience programs at home and at the school may provide an adequate training for the student.

Another way to look at these experience programs could be to group them according to the total number conducted at home, at school, and at business cooperators. This grouping would give fifty-one per cent at home, fourteen per cent at school, and twenty-seven per cent at business cooperators.

Does this imply that the parents of the students who have programs away from home do not help in planning and conducting the experience programs? This would be forty-one per cent of the total number of students. However, may of the parents of students with experience programs away from home may be actively involved in the programs.

Another area in Table V which might be of concern is the forty-six students who grow plants in the school greenhouse for their programs. Several questions that might arise are: (1) does the student care for the plants during a time which is beyond his regular vocational horticulture class? (2) are the plants owned by the student? and (3) are the plants sold and the returns paid to the student?

It would appear that some standards need to be developed for the experience programs of students in vocational horticulture. On the other hand, the questionnaire was not designed to determine whether or not the experience programs now being offered were meeting any set of standards.

Physical facilities

Table VI summarizes the responses to the question concerning the types of facilities available for the vocational horticulture programs. Fifty-nine per cent of the schools have glass greenhouses, 18 per cent plastic greenhouse, 18 per cent hotbeds, 41 per cent cold frames, 5 per cent lath houses, 68 per cent school-owned land laboratories, and 14 per cent other land used for laboratories.

It would appear that more schools should have available each of the facilities selected in Table VI in order to conduct effective programs. In Chapter III a table will be presented to indicate what the respondents consider to be minimum essential facilities.

The size of many of the present facilities seems to be rather inadequate. For example, Table VII shows that 61 per cent of the glass greenhouses are 700 or less square feet in size. This would give no more than 30 square feet of working space per student on the basis of the enrollment per school as presented in Table III. Average size of the greenhouses in the thirteen schools is 1382 square feet, and these same thirteen schools have an average enrollment of twenty-one students. This would allow sixty-six square feet of working space per student assuming the entire area could be utilized.

Table VI

NUMBER OF PER CENT OF SCHOOLS THAT HAVE SELECTED FACILITIES

Facility	Number of Schools	Per cent of Schools
School-owned land laboratory	15	68
Glass greenhouse	13	59
Cold frame	9	41
Plastic greenhouse	4 (1)	18
Hotbed	4	18
Other land used for laboratory	3 (2)	14
Lath house	1	5

(1) three of these schools also have a glass greenhouse.

(2) all three of these schools also have school-owned land laboratories.

It seems that sixty-six square feet of working space is small; and this amount is distorted by the large size of one greenhouse. As a result, there is the question of whether the present facilities are adequate, and if not, what can be done.

A factor which may help to determine what can be done about the size of the greenhouse is the method in which the present facilities are used. Table VIII indicates how the present greenhouse facilities are used. Seventy per cent use the greenhouse to the extent of much for demonstrations, seventy per cent for class projects, fifty-seven per cent for student projects, and seven per cent for money making.

Is this the best use of the greenhouse? It seems that the purpose of money making would be more desirable than indicated in Table VIII.

Table VII

SIZE OF SQUARE FEET OF GLASS GREENHOUSES

School	Number of Square Feet in Glass Greenhouse
Cleveland West Technical	7000*
Cleveland Memorial	2240
Westerville	2000
Cleveland John Adams	1753
Penta County	1176
Pleasant View	700
Canal Winchester	600
Dublin	600
Cleveland J. F. Kennedy	384
Hilliard	360
Kenton	360
Shawnee	300
Colonel Crawford	196

*Consists of four separate houses.

Table VIII

THE EXTENT TO WHICH THE GREENHOUSE IS USED FOR SELECTED PURPOSES

Purpose	Extent of Use		
	Much	Some	Little
Demonstrations	10	4	0
Class projects	10	4	0
Student projects	8	2	4
Money making (Operated on commercial basis)	1	7	6

Students need to learn to plan and conduct plant growing on a commercial basis for future employment. Therefore, why shouldn't the operation of a school greenhouse be simulated on a commercial operation basis? However, there must be a decision made for each school program as to which of the purposes selected in Table VIII are most beneficial to the students.

Summary

Chapter II has presented the number of years of vocational horticulture taught in each school and the subject topics taught in each school. Kinds of experience programs were discussed, and implications suggested for their improvement. Types of physical facilities available in each school were given, and the problem of inadequate size of selected facilities was discussed.

CHAPTER III

SUGGESTIONS FOR IMPROVEMENT IN THE VOCATIONAL HORTICULTURE PROGRAM IN OHIO

Vocational agriculture in Ohio high schools has made many changes in recent years. Some of the factors that have stimulated these changes are the increased enrollment of urban students, the decreased number of farms in Ohio, and the additional acts of Congress affecting vocational agriculture.

As a result, one of the major changes being made in the vocational agriculture program of Ohio is the development of horticulture within the program. Vocational horticulture received its first major emphasis in Ohio during the summer of 1963 when three pilot programs were started in Franklin County. Since that time, nineteen more schools have initiated and developed some type of program in vocational horticulture.

There are usually some problems involved with a new program, and therefore the author saw a need to include in the questionnaire some questions which would have the teachers of present vocational horticulture programs appraise and suggest improvements in the program. The responses from these questions are grouped into three major areas in Chapter III: (1) minimum essential school physical facilities,

(2) minimum size for experience programs, and (3) suggestions for improving the over-all program of vocational horticulture in Ohio.

Appraisal of Facilities by Teachers of Vocational Horticulture

The author suggested in Chapter II that there appears to be a need to improve the number and size of physical facilities. Table IX shows the number of teachers of vocational horticulture who consider selected facilities to be essential for the program. All teachers were asked to rate each of the selected facilities as essential, helpful but not essential, or not needed. A work room, glass greenhouse, and school owned land laboratories are the three items which are considered essential by the most number of teachers. However, this does not indicate that the other selected items would not be beneficial to the program.

Other teachers consider the work room, glass greenhouse, and school-owned land laboratory to be helpful, but not essential. The data presented in Table X reveals that nine per cent of the teachers consider a work room to be helpful, eighteen per cent consider a glass greenhouse to be helpful, and thirty-six per cent consider a school-owned land laboratory to be helpful. This seems to indicate that schools with programs of vocational horticulture should have at least these three types of facilities.

There is then the question of how large each facility should be. From the responses by the teachers concerning this question, it appears that some of the teachers may not be qualified to even attempt to answer this question. One teacher did respond that he was not qualified, and eight more teachers did not indicate a size for any of the selected facilities.

Table IX

NUMBER AND PER CENT OF TEACHERS OF VOCATIONAL HORTICULTURE WHO CONSIDERED SELECTED FACILITIES TO BE ESSENTIAL

Facility or Equipment	Number of Teachers	Per cent of Teachers
Work room and small equipment storage	17	77
Glass greenhouse	16	73
School-owned land laboratory	13	59
Cold frame	9	41
Rototiller	9	41
Soil sterilizer	8	36
Tractor	8	36
Hotbed	6	27
Other land used for laboratory	2	9
Plastic greenhouse	0	0

However, there were at least six responses for five of the selected items as shown in Table XI. From this table it would appear that the size of glass greenhouses should be 2239 square feet, work rooms 1053 square feet, and school-owned land laboratories 3.7 acres. of course these are averages, and therefore some may be much smaller depending upon the individual situation.

Table X

APPRAISAL OF THE NEED FOR SELECTED SCHOOL PHYSICAL FACILITIES BY TEACHERS OF VOCATIONAL HORTICULTURE

Facility or Equipment	Teacher Appraisal		
	Essential	Helpful but Not Essential	Not Needed
Work room and small equipment storage	17*	2	0
Glass greenhouse	16	4	0
School-owned land laboratory	13	8	0
Cold frame	9	7	1
Rototiller	9	8	1
Soil sterilizer	8	6	2
Tractor	8	5	5
Hotbed	6	6	7
Other land used for laboratory	2	6	2
Plastic greenhouse	0	17	0

*Some respondents did not indicate a rating for each of the items, and therefore the total number for each item may not equal twenty-two.

Table XI

NUMBER OF TEACHERS RESPONSES ON MINIMUM SIZE OF FACILITIES AND THE AVERAGE RECOMMENDED SIZE OF EACH FACILITY

Type of Facility	Number of Responses	Average Size Recommended (Square Feet)
Glass greenhouse	13	2239
Plastic greenhouse	9	761
School-owned land laboratory	8	(3.7 Acres)
Work room and small equipment storage	7	1053
Cold frame	6	115

Standards for Experience Programs

Several teachers stated in the questionnaire that the type and scope of experience programs need to be somewhat flexible to meet the needs of the students in different types of communities. However, it seems that most of the teachers believe there should be minimum standards in size for each type of experience program; but also realizing that the size does not necessarily mean a high quality program. Their responses are summarized in Table XII and Table XIII.

Although fifteen teachers indicated some where less than 500 square feet was the minimum size for a home flower garden, they did not indicate that the garden could not be larger. From the data, though, it appears that the minimum size for home flower gardens to be about 500 square feet, home vegetable gardens about 500 square feet, school vegetable gardens about 500 square feet, and nurseries about 10,000 square feet.

Minimum sizes for placement experience programs appear to be 200 hours for home placement, 200 hours for school placement, and 300 hours for commercial placement.

Table XII

NUMBER OF TEACHERS OF VOCATIONAL HORTICULTURE THAT RECOMMENDED VARIOUS SIZES FOR SELECTED PROJECT EXPERIENCE PROGRAMS

Type of Project Experience Program	Scope				
	Less Than 500 sq. ft.	500 - 2500 sq. ft.	2500 - 5000 sq. ft.	5000 - 10,000 sq. ft.	Over 10,000 sq. ft.
Home flower garden	15*	7	0	0	0
Home vegetable garden	7	8	3	3	1
School vegetable garden	7	3	3	3	3
Nursery	0	0	0	0	2

*Some respondents did not rate each item, and therefore the total number of ratings for each item may not equal 22.

Table XIII

NUMBER OF TEACHERS OF VOCATIONAL HORTICULTURE THAT RECOMMENDED VARIOUS SIZES FOR PLACEMENT EXPERIENCE PROGRAMS

Type of Placement Experience Program	Less Than 200 hrs.	200 - 300 hrs.	300- 400 hrs.	400- 500 hrs.	Over 500 hrs.
Home placement	10*	5	2	1	0
School placement	7	5	3	0	1
Commercial Placement	1	6	9	1	3

*Some respondents did not rate each item, and therefore the total number of ratings for each item may not equal 22.

Suggestions for Improving the Program of Vocational Horticulture in Ohio

This was an open-end question used on the questionnaire to determine how the instructors who are now teaching vocational horticulture would improve the program. The responses were grouped into the following eight categories: (1) improve training of teachers, (2) have greenhouse and laboratory facilities, (3) improve the curriculum, (4) conduct in-service training, (5) set up standards, (6) improve public relations, (7) conduct the program in a joint vocational school, and (8) have minimum of two-year program.

There is some similarity between several of the categories, but they may be considered separately as indicated in Table XIV. It should be mentioned that all twenty-two teachers did not respond to this question, but the answers given appear to give some indication as to the areas in the program that need to be improved. One or more of these areas would seem to be good topics for a summer workshop in vocational horticulture.

Table XIV

NUMBER AND PER CENT OF TEACHERS WHO INDICATED A NEED FOR IMPROVEMENT IN SELECTED AREAS OF THE PROGRAM OF VOCATIONAL HORTICULTURE

Area of Improvement	Number of Teachers	Per cent of Teachers
Training of teachers	9	41
Greenhouse and laboratory facilities	7	32
Curriculum	5	23
In-service training	4	18
Program standards	4	18
Joint vocational schools	3	14
Public relations	3	14
Two-year program	2	9

Of the forty-one per cent of teachers who mentioned training of teachers, forty-four per cent of them suggested that teachers should have experience in the commercial field of horticulture. An implication might be to suggest that all teachers of vocational horticulture should work one or two summers in a garden center or related area.

In-service training was indicated as a need by eighteen per cent of the teachers. Another fourteen per cent suggested workshops in the area of training of teachers, which appears to indicate that 32 per cent of the teachers would definitely like to have more summer workshops in horticulture.

Summary

This chapter pertained to the questions concerning the appraisals and suggestions for improving the program of vocational horticulture in Ohio. The respondents indicated minimum essential facilities, minimum size for experience programs, and needed areas of improvement.

Answers to the question, "How would you improve the vocational horticulture program in Ohio?" were grouped into the following areas: training of teachers, greenhouse and laboratory facilities, curriculum, in-service training, program standards, joint vocational school, public relations, and two-year programs. Seventy-three per cent of the teachers responded to this question.

CHAPTER IV

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Purpose

The purpose of this study was two-fold: (1) to determine the desirable experiences that can be provided to students in vocational horticulture, and (2) to determine how these experiences should be provided.

Specific Objectives

The specific objectives of this study were:

1. To determine the kinds of vocational horticulture programs that are offered to students enrolled in vocational horticulture in Ohio.

2. To determine the types and scopes of experience programs now being offered to students enrolled in all high school vocational horticulture courses in Ohio.

3. To obtain teacher appraisals of the types and scopes of experience programs which should be required for vocational horticulture students.

4. To obtain teacher appraisals of the needed facilities in a high school to help provide satisfactory experience programs for students of vocational horticulture.

Method of Investigation

A list of all schools in Ohio who reported a program in vocational horticulture for the school year 1965-66 was obtained from Mr. Darrell Parks of the State Department of Education, Vocational Agriculture Service.

Questionnaires were developed to answer the objectives of the study and sent to the twenty-nine schools on the list. Therefore, the population of the study was not a sample. Twenty-six questionnaires were returned and revealed that four of the schools did not have programs of vocational horticulture. Data for the study was obtained from twenty-two of the twenty-five schools in Ohio which offered a program of vocational horticulture. This was an eighty-eight per cent response.

The findings of this study were presented as concise as possible in Chapters II and III. Therefore, the findings are not repeated in this chapter. The conclusions immediately follow this section.

Conclusions

The following conclusions are presented based upon the facts and opinions of the twenty-two teachers of vocational horticulture, and the interpretation and opinion of the author:

1. The twenty-two schools reported 509 students enrolled in vocational horticulture during 1965-66 which represents about four per cent of the total vocational agriculture enrollment in Ohio.

2. Eighteen per cent of the vocational horticulture courses are three years in length and thirty per cent are two-year programs.

3. One-half of the courses are one year long or combined with vocational agriculture .

4. Nine selected topics are taught in some grade level in vocational horticulture classes by at least 70% of the teachers.

5. Some topics, such as landscaping, are taught in all grade levels.

6. Fifty-one per cent of the experience programs are conducted at home, 27% at cooperating businesses, and 14% at the school.

7. Eighteen and one-half per cent of the students conducted their experience program in the school greenhouse or had no experience program.

8. The teachers recommend the following minimum standards for experience programs: 500 square feet for home flower or garden projects or 10,000 square feet for nurseries.

9. Teachers recommended 200 hours per year per student for home placement experience, or 200 hours for school placement, or 300 hours for commercial placement.

10. Available physical facilities in present programs of vocational horticulture are: 68% of the schools have school-owned land laboratories, 59% glass greenhouses, 41% cold frames, 18% plastic greenhouses, 18% hotbeds, 14% other land used for laboratories, and 5% lath houses.

11. The average total space available per student in the glass greenhouses is 66 square feet.

12. Seventy-seven per cent of the teachers consider a work room to be essential for the program, 73% a glass greenhouse, 59% a school-owned land laboratory.

13. Teachers recommend the average size for facilities to be: (1) 2239 square feet, glass greenhouse, (2) 11053 square feet, work room, (3) 761 square feet, plastic greenhouse, (4) 115 square feet, cold frame, and (5) 3.7 acres, school-owned land laboratory.

Recommendations

From the appraisals and suggestions of the twenty-two teachers of vocational horticulture, and the opinion of the author, the following recommendations are presented:

1. Programs of vocational horticulture should be at least two years in length.

2. A curriculum guide should be used by teachers of vocational horticulture to determine the grade level which is best suited to teach each topic in the program.

3. Better experience programs with minimum standards should be planned and conducted by all students in vocational horticulture to develop needed competencies for employment in horticulture fields.

4. Minimum types and sizes of physical facilities should be required for all programs of vocational horticulture.

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Parks, Darrell. Assistant State Supervisor, Vocational Agriculture Service, G-16 State Office Building, 65 South Front Street, Columbus, Ohio 43215.

APPENDIX

September 22, 1966

Dear Co-Worker:

I am sure that you have as great an interest as I do in the Vocational Horticulture program in Ohio. We need to continously evaluate and improve the program, and make all the information available to all Vocational Horticulture teachers.

I accepted this project as part of my in-service training which I am working on in cooperation with Dr. Willard Wolf. All answers will be confidential, and I will send a digest of the findings to you.

The questionnaire is somewhat lengthy, but I hope you will find time to complete and return it within a week or two so that I will be able to prepare the report of finding this quarter.

Sincerely,

Bernard Nirode

NAME _____

SCHOOL _____

GENERAL QUESTIONS

1. How many years has the school offered a course (s) in vocational horticulture? _____

2. How many semesters of vocational horticulture are now offered in the school? 1 ____, 2 ____, 3 ____, 4 ____, 5 ____, 6 ____, 7 ____, 8 ____.

3. What is the area (s) of major emphasis in each year of your vocational horticulture course (s)?

PLACE AND X IN THE APPROPRIATE BOXES

	Freshman	Soph.	Junior	Senior
Introductory horticulture*				
Landscaping				
Nursery				
Floriculture				
Turf management				
Ornamental horticulture				
Forestry				
Vegetables				
Fruits				
Soils and Fertilizers				
Plant structures and processes				
Conservation				

*Includes careers and opportunities, and a general knowledge of the field of horticulture.

Other				

4. What was the student enrollment in vocational horticulture the last five years?

	1965-66	1964-65	1963-64	1962-63	1961-62
Freshman					
Sophomore					
Junior					
Senior					

5. What are the major objectives of the vocational horticulture program?

A._____

B._____

C._____

D._____

E._____

6. How much credit is offered to the student for each course in vocational horticulture?

For each semester_____

For each year_____

TEACHER BACKGROUND AND TRAINING

1. How many years have you taught a course (s) in vocational horticulture?_____

2. Please list all the college level courses which you have taken in horticulture or related to horticulture, and rate each one by placing an X in the appropriate column.

Please give title of course	QUARTER HOURS	NO VALUE	LITTLE VALUE	MUCH VALUE
1.				
2.				
3.				
4.				
5.				
6.				
7.				
8.				
9.				
10.				
11.				
12.				

3. In what subject area (s) is your major weakness (s) in teaching vocational horticulture?

A. _____

B. _____

C. _____

D. _____

E. _____

4. What occupational experience have you had in horticulture other than as a teacher of vocational agriculture or horticulture?

---

5. To what extent have the following helped you in becoming competent in teaching vocational horticulture?

Place an X in the appropriate column:

	NO VALUE	SOME VALUE	MUCH VALUE
college courses			
technical literature			
commercial operators			
occupational experience			
extension personnel			
college staff personnel			
other			

6. What program of training, including college courses, do you suggest for preparing teachers of vocational horticulture?

PHYSICAL FACILITIES

1. Indicate the size of the following school physical facilities which are used in connection with the vocational horticulture program.

FACILITY	SIZE	
glass greenhouse.....	x	(width x length)
plastic greenhouse.....	x	

hotbed..... x

cold frame..... x

school-owned land used for laboratory_____acres

other land used for laboratory_____acres

what else is available_____

_____

_____

_____

IF YOU HAVE A GREENHOUSE, PLEASE ANSWER THE FOLLOWING QUESTIONS:

2. Is the greenhouse heated with the central heating system from the main school building? yes_____ no_____

3. What is the type of heat? steam_____, hot water_____, gas unit heater_____, fuel oil unit heater_____, other_____.

4. Which of the following are controlled automatically?

heat_____, ventilation windows_____, fans_____, humidity_____, sprinkling system_____.

5. To what extent is the greenhouse (s) used for the following?

CHECK ONE COLUMN FOR EACH ITEM

	MUCH	SOME	LITTLE
demonstrations			
money making (commercial)			
student projects (learning experiences)			
class projects			

6. What crops are grown in the greenhouse? cut flowers_____, potted flowers_____, vegetables_____, small fruits_____, nursery crops_____, bedding plants_____, other_____.

7. How is the greenhouse used during the summer?

_____

_____

_____

_____

_____

8. To what extent is the land laboratory used for the following:

	MUCH	SOME	LITTLE
demonstrations			
student projects			
money making (commercial)			
class projects			

9. What crops are grown on the land laboratory?

corn_____, soybeans_____, small grains_____, hay_____, vegetables_____, small fruits_____, fruit trees_____, flowers_____, nursery stock_____, rose garden_____, formal garden_____, turf plots_____, other (please list)_____.

10. What is the main source of equipment used on the land laboratory?

school-owned_____, F.F.A. owned_____, student and/or parent owned_____, Other_____.

11. What use is made of school owned ground, or other land, by the horticulture classes?

_____

_____

_____

_____

STUDENT EXPERIENCE PROGRAMS

1. What occupational experience programs were used last year by vocational horticulture students?

PLEASE INDICATE THE NUMBER OF STUDENTS FOR EACH TYPE OF OCCUPATIONAL EXPERIENCE PROGRAM

	Freshman	Soph.	Junior	Senior
home flower garden				
home vegetable garden (less than 1/4 acre, about 100' x 100')				
home truck garden (over 1/4 acre)				
school garden (less than 1/4 acre)				
school truck garden (over 1/4 acre)				
work placement at home (less than 250 hours)				
(more than 250 hours)				
work placement at commercial business (less than 250 hours)				
(more than 250 hours)				
no planned occupational experience				
other (please list)				

2. What are the occupational experience program requirements which you have for vocational horticulture students?

TYPE OF OCCUPATIONAL EXPERIENCE	SCOPE OR HOURS (if no requirement, please indicate none.)
Home flower garden	
Home vegetable garden	
Home truck garden	
School vegetable garden	
School truck garden	
Work placement at home	
Work placement at commercial business	
Work placement at school	
Other (please list)	

TEACHER APPRAISAL OF SCHOOL PHYSICAL FACILITIES AND STUDENT OCCUPATIONAL EXPERIENCE PROGRAMS

1. What do you consider to be the minimum essential school physical facilities for a vocational horticulture program?

(Please check one column and indicate your recommended size for the essential and helpful facilities.)

	Essential	Helpful, but not essential	Not needed	Recommended size (length x width)
Glass greenhouse				
Plastic greenhouse				
Hotbed				
Cold frame				

School owned laboratory				
Other land used for laboratory				
Work room and small equipment storage				
Soil sterilizer				
Rototiller				
Tractor				
Other (please list)				

2. What should be the vocational horticulture teacher's responsibility in maintaining the greenhouse?

the land laboratory?

3. What do you foresee in the near future as standards for occupational experience programs in vocational horticulture?

4. Please check what you think should be the minimum size or scope for each type of experience.

	less then 500 sq. ft. (25' x 20')	500-2500 sq. ft.	2500-5000 sq. ft. (1/16-1/8 A)	5000-10,000 sq. ft. (1/8-1/2 A)	10,000 sq. ft. & over (1/2 A or more)
home flower garden					

home vegetable garden					
school vegetable garden					
other (please list)					

	less than 200 hrs.	200-300 hrs.	300-400 hrs.	400-500 hrs.	over 500 hrs.
Home placement					
Placement school					
Commercial placement					

5. How would you improve the vocational horticulture program in Ohio?

_____

_____

_____

_____

_____

_____

_____

_____

_____